

Application No. 10/634,474

Docket No. 1999U026.US-CON2

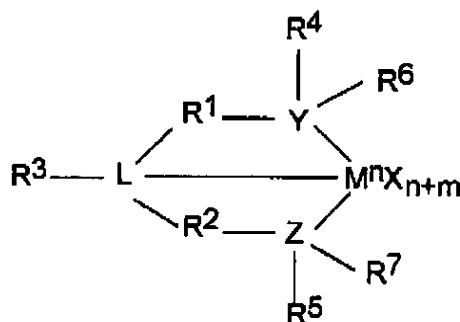
Reply to Office Action Dated April 26, 2004

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A process of polymerizing olefin(s) to produce a polyolefin comprising contacting in a reactor olefins and a catalyst composition comprising at least one activator, a Group 15 containing compound and a bulky ligand metallocene catalyst compound at a reaction temperature of from 30°C to 120°C; wherein raising or lowering the reaction temperature narrows or broadens the Mw/Mn of the polyolefin, respectively; and wherein the Group 15 containing metal compound is represented by the formula:



wherein M is a Group 4, 5 or 6 metal;

each X is independently a leaving group;

y is 0 or 1;

n is the oxidation state of M;

m is the formal charge of the ligand comprising the YZL or YZL' groups;

L is a Group 15 or 16 element;

~~L' is a Group 15 or 16 element or Group 14 containing group;~~

Y is a Group 15 element;

Z is a Group 15 element;

Application No. 10/634,474

Docket No. 1999U026.US-CON2

Reply to Office Action Dated April 26, 2004

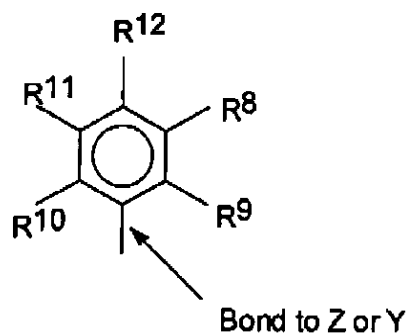
R^1 and R^2 are independently a C_1 to C_{20} hydrocarbon group, a heteroatom containing group having up to twenty carbon atoms wherein R^1 and R^2 may be interconnected directly to each other;

R^3 is absent or a hydrocarbon group, hydrogen, a halogen, or a heteroatom containing group;

R^4 and R^5 are independently an alkyl group, an aryl group, substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, a cyclic arylalkyl group, a substituted cyclic arylalkyl group or multiple ring system; wherein R^4 and R^5 may be interconnected directly to each other; and

R^6 and R^7 are independently absent, or hydrogen, an alkyl group, halogen, heteroatom or a hydrocarbyl group.

2. (Previously presented) The process of Claim 1, wherein R^4 and R^5 are represented by the formula



wherein R^8 to R^{12} are each independently hydrogen, a C_1 to C_{40} alkyl group, a halide, a heteroatom, or a heteroatom containing group containing up to 40 carbon atoms.

3. (Previously presented) The process of Claim 2, wherein R^8 to R^{12} are each independently a C_1 to C_{20} linear or branched alkyl group, wherein any two R^8 to R^{12} groups may form a cyclic group or a heterocyclic group, and wherein the cyclic group may be aromatic.

Application No. 10/634,474

Docket No. 1999U026.US-CON2

Reply to Office Action Dated April 26, 2004

4. (Currently amended) The process of Claim 1, wherein M is a Group 4 metal and each of L, L', Y and Z are nitrogen atoms.
5. (Original) The process of Claim 1, wherein the catalyst composition is supported.
6. (Previously presented) The process of Claim 1, wherein the catalyst composition is introduced into the reactor as an alkane solution, suspension or emulsion.
7. (Original) The process of Claim 1, wherein the process is a slurry process or a gas phase process.
8. (Previously presented) The process of Claim 1, wherein the olefins are ethylene and at least one olefin comonomer selected from the group consisting of olefins having from 4 to 12 carbon atoms.
9. (Original) The process of Claim 8, wherein a polyethylene copolymer is isolated having a bimodal molecular weight distribution; and wherein the Mw/Mn value of the copolymer ranges from 20 to 40.
10. (Previously presented) The process of Claim 9, wherein the copolymer comprises a higher molecular weight component and a lower molecular weight component; wherein the weight average molecular weight M_w of the high molecular weight component of the copolymer is above 150,000 a.m.u.
11. (Original) The process of Claim 10, wherein the weight average molecular weight M_w of the high molecular weight component of the copolymer is above 250,000 a.m.u.
12. (Original) The process of Claim 8, wherein a polyethylene copolymer is isolated having a density in the range of from 0.940 to 0.947 g/cm³.

Application No. 10/634,474

Docket No. 1999U026.US-CON2

Reply to Office Action Dated April 26, 2004

13. (Original) The process of Claim 8, wherein a polyethylene copolymer is isolated having a I_2/I_1 value of 80 or more.
14. (Original) The process of Claim 8, wherein a polyethylene copolymer is isolated having a I_2 between 0.01 and 10 dg/min.
15. (Original) The process of Claim 8, wherein a polyethylene copolymer is isolated having an extrusion rate of greater than about 17 lbs/hour/inch of die circumference.
16. (Original) The process of Claim 8, wherein the polyethylene copolymer is formed into a film or a pipe.
17. (Original) The process of Claim 8, wherein the C_x/C_2 ratio, where C_x is the amount of comonomer and C_2 is the amount of ethylene, is between about 0.001 to 0.0100.
18. (Previously presented) The process of Claim 1, wherein the Group 15 containing catalyst compound and the bulky ligand metallocene catalyst compound are combined at molar ratios of from 10:90 to 90:10.
19. (Original) The process of Claim 1, wherein the bulky ligand metallocene catalyst compound comprises at least one fluoride or fluorine containing leaving group.
20. (Currently amended) The process of Claim 7, wherein the process is a gas phase fluidized bed process; and wherein the C_x/C_2 mole ratio, where C_x is the amount of comonomer and C_2 is the amount of ethylene, is between about 0.001 to 0.010.
21. (Original) The process of Claim 1, wherein the properties of the polyolefin are controlled by changing the amount of bulky ligand metallocene catalyst compound combined.
22. (Original) The process of Claim 1, wherein the polyolefin is produced in a single reactor.